

USING A MODIFIED QuEChERS METHOD AND UHPLC-MS/MS FOR THE DETERMINATION OF PESTICIDES APPLIED BY ENDOTHERAPY TO COCONUT (*Cocosnucifera* L.) TREE TRUNKS

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The coconut palm is one of the most important plants found in tropical and subtropical ecosystems because it is used to produce valuable foodstuffs. However, coconut palm cultures are susceptible to pests and diseases that jeopardize production and affect the quality of the harvested fruits. The application of pesticides is still a valuable practice to control pests and diseases by either classical (*i.e.*, spraying) or endotherapeutic methods (*i.e.*, injection or infusion of hazardous chemicals to the stem). However, only a few studies have reported the translocation of these compounds within the plants. In addition, the selection criteria regarding the number of treatments, dosage, and design of equipment for these applications are heavily limited by the lack of translocation data. In this study, we developed and validated an analytical method to determine ten pesticides typically applied to coconut palm cultures, namely, 3-hydro-carbofuran, carbendazim, carbofuran, cyproconazole, difenoconazole, espiroclorfen, imidacloprid, thiabendazole, thiamethoxan, and thiophanate-methyl. Sample cleanup and analyte isolation was performed by a modified acetate-buffered QuEChERS (Quick, Easy, Cheap, Effective, Rugged, and Safe) method. The analytes were separated and detected by ultra high-performance liquid chromatography coupled to tandem mass spectrometry (UHPLC-MS/MS). The method was validated at three concentrations, namely, 40.0, 80.0, and 200 µg/kg. The recoveries were determined in triplicate and ranged from 70 to 93%. The relative standard deviations were below 10% and the intermediate precision varied from 3 to 6 %CV. The limits of detection (LOD) and quantification (LOQ) were determined as 12 and 40 µg/kg, respectively. The proposed method was successfully applied to samples harvested at a 15 cm distance from the application point – site of pesticide injection – and sampled within 24 h.

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